AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A photovoltaic power converter system comprising:

a photovoltaic array;

an inverter electrically coupled to said photovoltaic array to inject an output current to a mains grid supply voltage; and

a controller including a first circuit coupled to receive a load current and filter separate out a harmonic component from the load current to measure a load harmonic current; a second circuit for determining an amplitude of an injectable current available from the photovoltaic array to generate a fundamental sinusoidal current reference that is phased locked with the mains grid supply voltage; and a third circuit for combining the load harmonic current and the fundamental sinusoidal current reference to generate a command output signal,

wherein the controller is configured to generate an error signal based on a difference between the command output signal and the output current, and

wherein the controller is configured to process the error signal and to generate a switching signal for actuating a switching gate of said inverter to compensate for the load harmonic current when said inverter injects the output current to the mains grid supply voltage.

2. (Original) The photovoltaic power converter system of claim 1, wherein said first circuit comprises a notch filter configured to pass harmonics present in said load current.

3. (Original) The photovoltaic power converter system of claim 1, wherein said second circuit comprises a phase lock loop coupled to receive said supply voltage and generate a sinusoid corresponding to the frequency of said supply voltage.

4. (Original) The photovoltaic power converter system of claim 3, wherein said second circuit further comprises a mixer configured to receive said sinusoid and a signal indicative of the magnitude of current available from the photovoltaic array for generating said fundamental reference.

5. (Original) The photovoltaic power converter system of claim 1, wherein said controller is selected from the group consisting of a micro-controller, a Field Programmable Gate Array device and an Application Specific Integrated Circuit device.

6. (Currently Amended) A controller for a photovoltaic power converter system including a photovoltaic array coupled to an inverter to generate an output current for energizing a load connected to said inverter, said controller comprising:

a first circuit coupled to receive a load current and ~~filter~~ separate out a harmonic component from the load current and to measure a harmonic current;

a second circuit for determining an amplitude of an injectable current available from the photovoltaic array to generate a fundamental sinusoidal current reference that is phased locked with a mains grid supply voltage; and

a third circuit for combining the load harmonic current and the fundamental sinusoidal current reference to generate a command output signal,

wherein the controller is configured to generate an error signal based on a difference between the command output signal and the output current, and

wherein the controller is configured to process the error signal and to generate a switching signal for actuating a switching gate of said inverter to compensate for the load harmonic current when said inverter injects the output current to the mains grid supply voltage.

7. (Original) The controller of claim 6, wherein said first circuit comprises a notch filter configured to pass harmonics present in said load current.

8. (Original) The controller of claim 6, wherein said second circuit comprises a phase lock loop coupled to receive a supply voltage and generate a sinusoid

corresponding to a frequency of said supply voltage.

9. (Original) The controller of claim 8, wherein said second circuit further comprises a mixer configured to receive said sinusoid and a signal indicative of the magnitude of current available from the photovoltaic array for generating the fundamental reference drawn by said load.

10. (Original) The controller of claim 6, selected from the group consisting of a micro-controller, a Field Programmable Gate Array device, and an Application Specific Integrated Circuit device.

11. (Currently Amended) A method for controlling a photovoltaic power converter system including a photovoltaic array coupled to an inverter to generate an output current for energizing a load connected to said inverter, said method comprising:

receiving a load current to ~~filter~~ separate out a harmonic component from the load current and to measure a load harmonic current;

determining an amplitude of an injectable current available from the photovoltaic array and generating a fundamental sinusoidal current reference that is phase locked with the mains grid supply voltage; and

combining the load harmonic current and the fundamental sinusoidal current reference to generate a command output signal,

whereby the controller is configured to generate an error signal based on a difference between the command output signal and the output current, and

whereby the controller is configured to process the error signal and to generate a switching signal for actuating a switching gate of said inverter to compensate for the load harmonic current when said inverter injects the output current to the mains grid supply voltage.

12. (Original) The method of claim 11, wherein the receiving of the load

current comprises processing said load current to pass harmonics present in said load current.

13.   (Original)   The method of claim 11, wherein said generating of a fundamental reference comprises receiving a supply voltage to generate a sinusoid corresponding to a frequency of said supply voltage.

14.   (Original)   The method of claim 13, wherein said generating of a fundamental reference further comprises mixing said sinusoid and a signal indicative of the magnitude of current available from the photovoltaic array for generating the fundamental reference drawn by said load.